

WHAT IS CLAIMED IS:

1. An electrochemical sensor comprising:

a sensor electrode array;

an operating electronic unit integrated on a chip for operating the sensor electrode array and for processing electrical signals received therefrom, the operating electronic unit including a potentiostat circuit and a microprocessor receiving and further processing signals processed by the operating electronic unit, said potentiostat circuit being a digital control circuit whose controller function is controlled by said microprocessor, said microprocessor being integrated on the chip of said operating electronic unit.

2. An electrochemical sensor in accordance with claim 1, further comprising a memory with stored operating parameters of said sensor electrode array, said microprocessor reading parameters from said memory to carry out a control algorithm depending on the parameters.

3. An electrochemical sensor in accordance with claim 2, wherein said microprocessor determines operating parameters of said sensor electrode array by performing test functions before the sensor is put into operation and/or at regular intervals and to adapt said control algorithm to same.

4. An electrochemical sensor comprising:

a sensor electrode array;

an operating electronic unit with a digital control circuit including an analog to digital converter connected to said array, a digital to analog converter connected to said array and a microprocessor with a control algorithm connected to digital connections of said analog to digital converter and said digital to analog converter to form a potentiostat circuit with said microprocessor receiving and processing signals said microprocessor, said analog to digital converter and said digital to analog converter being integrated on a single chip.

5. An electrochemical sensor in accordance with claim 4, further comprising a multiplexer connecting at least one of said analog to digital converter to said array and said digital to analog converter to said array, said multiplexer being integrated on said single chip.

6. An electrochemical sensor in accordance with claim 4, further comprising a memory with stored operating parameters of said sensor electrode array, said microprocessor reading parameters from said memory to carry out said control algorithm depending on the parameters.

7. An electrochemical sensor in accordance with claim 4, wherein said microprocessor determines operating parameters of said sensor electrode array by

performing test functions before the sensor is put into operation and/or at regular intervals and to adapt the control algorithm to same.

8. A process for electrochemically sensing, the process comprising the steps of:

providing a sensor electrode array;

providing a digital control circuit including an analog to digital converter connected to said array, a digital to analog converter connected to said array and a microprocessor;

providing said microprocessor with a control algorithm;

providing said microprocessor connected to digital connections of said analog to digital converter and said digital to analog converter and integrated on a chip;

processing signals at said microprocessor to form a potentiostat circuit controlling the potential difference on the sensor electrode array.

9. A process for electrochemically sensing in accordance with claim 8, further comprising:

providing a multiplexer connecting at least one of said analog to digital converter to said array and said digital to analog converter to said array, said multiplexer being integrated on said single chip.

10. A process for electrochemically sensing in accordance with claim 8, further comprising

providing a memory with stored operating parameters of said sensor electrode array, said microprocessor reading parameters from said memory to carry out said control algorithm depending on the parameters.

11. A process for electrochemically sensing in accordance with claim 8, wherein
5 said microprocessor determines operating parameters of said sensor electrode array by performing test functions before the sensor is put into operation and/or at regular intervals and to adapt the control algorithm to same.